

Information and Communication Technology (ICT) in tourism undergraduate programmes: a multidimensional analysis of the syllabi



Tecnologia da Informação e Comunicação [TIC] em cursos de graduação em Turismo: Uma análise multidimensional das ementas

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RESUMO

As Tecnologias da Informação e Comunicação [TIC] estão cada vez mais presentes na sociedade, e o conhecimento sobre estas tecnologias mais requisitadas em uma vaga no mercado. Assim, esse estudo é fruto do Grupo de Pesquisa Turismo, Educação, Emprego e Mercado (TEEM), que envolve pesquisadores(as) de Iniciação Científica e do Programa de Pós-Graduação em Turismo, e tem como objetivo investigar a presença da tecnologia e da informação em disciplinas dos cursos superiores de turismo das universidades públicas do Brasil, a fim de entender a inserção das TICs nos planos de ensino dos cursos de Turismo. Para alcançar o objetivo foi realizada uma pesquisa de abordagem qualitativa e exploratória, dividida em três etapas: pesquisa bibliográfica a partir dos descritores: "ITC - Information Technology and Communication" e "Tourism" nas bases de dados da Web of Science [WoS] e Publicações de Turismo; pesquisa documental em mídia eletrônica, onde foram levantadas 31 disciplinas relacionadas às TICs em 26 universidades; e por fim, a análise das ementas, no software Interface de R pour les *Analyses Multidimensionnelles de Textes et de Questionnaires* [IRAMUTEQ], e de suas bibliografias. A partir das análises do software foi possível separar as ementas em 5 classes: Operacional (23,3%); Processual (16,7%); Experiência Turística

(20%); Comunicação e Dados (16,7%); e Empresas Turísticas (23,3%). De acordo com a classificação das ementas e a análise das bibliografias, compreendeu-se a aplicação das disciplinas relacionadas às TICs nas instituições de ensino, considerando a importância desses conteúdos na graduação para atender as necessidades do mercado de trabalho em turismo.

Palavras-chave: Turismo; Tecnologia da Informação e Comunicação; Cursos Superiores, Ementas; IRAMUTEQ.

ABSTRACT

Information and Communication Technologies [ICT] are increasingly present in society and knowledge about these technologies has become essential in the search for placement in the labor market. Thus, this study is part of a research of the Research Group Tourism, Education, Employment and Market (TEEM), involving junior researcher and graduate researchers from the Master's Program in Tourism. The article aims at investigating the occurrence of technology and information in disciplines in tourism at the higher education level at public universities in Brazil, in order to understand the insertion of ICTs in the Study Programs of Tourism courses. To achieve the proposed objective, qualitative and exploratory research was carried out. The research was divided into three stages: bibliographic research seeking the descriptors: "ITC - Information Technology and Communication" and "Tourism" in the "Web of Science [WoS]" and "Tourism Publications" databases. Documentary research in electronic media, in which 31 disciplines related to Information and Communication Technologies were identified in 26 universities. And the last step was the analysis of the 31 syllabi in the 'Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires [IRAMUTEQ]' and their bibliographies. From the software analysis, it was possible to separate the syllabi into 5 classes: 'Operational' (23.3%); 'Procedural' (16.7%); 'Tourist Experience' (20%); 'Communication and Data' (16.7%); and 'Tourism Companies' (23.3%). According to the classification of the menus and analysis of the bibliographies used, it was understood the application of disciplines related to ICTs in educational institutions, considering the importance of these contents in the graduation to meet the needs of the labor market in tourism.

Keywords: Information and Communication Technology; Higher Education; Syllabi; IRAMUTEQ.

INTRODUCTION

In the context of a globalization scenery, marked by the Technology Era, the Information and Communication Technology (ICT), is, on one hand,



transforming the relations and society's behaviors and, on the other hand, interfering and altering the companies' environment, once it allows structural changes and advances, which contribute to the growth and development of such organizations. Tourism, as an area in which such processes have become particularly evident, is each day more, impacted by such modernization, many time disruptive. Consequently, tourism has faced major challenges to find ways to consider the future, from such phase of reconfiguration, as well as, to preview the changes that will be necessary in order to answer the possible transformations in their markets, processes and systems (Hughes & Moscardo, 2019).

The knowledge of such technologies has become an almost essential requirement in the search for a job in contemporary society and, this way, the centers of formation and the universities have to take notice of such fact and act upon it (Infante-Moro, Infante-Moro & Gallardo-Pérez, 2019). In the Brazilian case, the incentive of ICT in the educational process of higher education occurs through the Science, Technology and Innovation Ministry, by stimulating innovation through the Law of Innovation (former Law nº 10,973 from December 02, 2004, altered by the Law nº 13,243, from January 11, 2016), which "established measures of incentive and scientific and technology research in the productive environment, aiming at technological capacity, reaching technological autonomy and the development of the national and regional productive system of the country" (Law nº 13.243, 2016), becoming a regulatory mark regarding innovation in Brazil.

However, due to the relevance of the theme, the incentive of ICT in the educational process has already been approached by other authors in previous researches. The study of Silva Pereira, et al. (2012), had as purpose to identify how many Brazilian Superior Education Institutes (SEI) had courses of Business, Accounting, Tourism and Management presenting the term "innovate" in the name of the discipline (Silva Pereira, et al. 2012), thus, the authors were not able to obtain sufficient results to clarify the researched content, due to a lack of information of the courses in the websites.



This way, this study is the result of the research from the Group of Research Tourism, Education, Employment and Market (TEEM), which involves junior researchers and researchers from the Post Graduation Program in Tourism, and has as purpose to investigate the presence of technology and of information in disciplines of tourism higher education courses in public universities in Brazil, in order to understand the insertion of ICT in the Programs of Study from the Tourism courses. The study of disciplines through syllabi is justified considering that the first findings of the research project, which includes other plans of work, indicated that the relation between technology and tourism is conducted through a shallow direct relation. Therefore, it was chosen to investigate the presence of technology in the pedagogic projects of tourism higher education courses, as a strategy to route the transformation of such relation – tourism and technology – starting at Higher Education.

To reach the proposed goal, public universities in Brazil which offered Tourism graduation courses were mapped, and courses which presented disciplines regarding ICT were chosen. Through the syllabi of such disciplines, a textual analysis was conducted through the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* [IRAMUTEQ], and the raise of bibliographic sources used in such disciplines was also conducted. As a delimitation from the object of study, it was chosen to select only tourism graduation courses present in public universities in Brazil, once such courses have migrated mainly to the federal and state learning centers in the country, as highlighted in previous analysis from the research group. In addition, according to Catramby (2018), nowadays, it is most common to find the full course load (bachelor and license degree) in public institutions.

Therefore, this work is structured in introduction, followed by a review of the literature, which discuss the context of Higher Education in Brazil and the essential role of Pedagogic Projects, and followed by the importance of learning ICT in Tourism courses. Posteriorly, the implemented methodological procedures are presented to reach the proposed goal to understand how such learning occurs, followed by the presentation of the results and



discussions surrounding the theme. At last, in the conclusion, the final contributions are presented, limitations and suggestions for the continuity of the research, followed by the references used.



REVIEW OF THE LITERATURE

Information Technology and Tourism Communication (ICT)

The organizations have progressively perceived the need to invest in intellectual capital. The corporate education focused on Information Technology and Communication has shown to be an alternative to fill this need (da Silva, de Morais Lima, & Mendes Filho, 2020). For the organizations of tourism, the challenge is to find ways of thinking about the future to this reconfiguration phase and to foresee the changes that can be necessary to answer possible transformations in their markets, processes and systems (Hughes & Moscardo, 2019).

Authors such as Santos & Wada (2017), highlighted that the evolution of the ICT enabled the planning of trips with several motivations, without the need of intermediate, through the improvement in the amount of information that the tourist has when arriving at the destination. The insertion of the ICT applied in the area of tourism has become a recurrent theme in current studies. It is approached in marketing and consumer behavior (Barbosa & Medaglia, 2019); in the use of travel apps (Rodrigues & Alexandre, 2020) and even in the recent Intelligent Tourism Destinations (Gomes, Gandara & Ivars-Baidal, 2017; Lima & Mendes Filho, 2021).

In the scope of the current research, it is possible to highlight areas of the tourism market which traditionally employ tourism professionals (Silveira, Medaglia & Nakatani, 2020), such as tourism agencies (Silva, Morais Lima & Mendes Filho, 2020; Costa, De Araújo & Perinotto, 2019) and housing (Praničević & Mandić, 2020; Nimatulaev et al., 2020). Silva, Morais Lima & Mendes Filho (2020), highlight the ICT as learning tools in the travel agencies. According to the authors, these companies have been facing challenges with the technological advance, in the sense of the easiness which internet access provokes in the traveling process, which causes a desintermediation between the travel agency and the consumer (Silva, Morais Lima & Mendes Filho, 2020). However, when well executed, such instruments facilitates buying



and selling products and tourism services, in the communication, in the access to information and in the interaction between consumers and salespeople, as well as between consumers themselves, through comments and evaluations in specialized websites (Costa, De Araújo & Perinotto, 2019).

To use the internet to obtain advantage is an opportunity for agents to conquer space and clients, since, through the internet, information becomes more accessible and globalized. To adhere to such technology's use has promoted structural and technological changes in the field of activities from travel agencies since it has aided buying and selling tourism products and services (Costa, De Araújo & Perinotto, 2019). The use of the internet to improve the status of learning from travel agencies employees enables the offer of opportunities without precedent to improve the services provided by such companies (Silva, Morais Lima & Mendes Filho, 2020).

In the housing sector, due to the crescent pressure of providing more sophisticated products with the purpose of increasing the business' efficiency, this led the housing sector to become more dependent on ICT in several aspects of its business (Praničević & Mandić, 2020). According to the authors, Praničević & Mandić (2020), who expatiate on the ICT in the industry of hospitality, the technology innovations in hosting are referred mainly to the intelligent mobile technologies, internet of things (IoT), cloud computing, big data, intelligent devices, new tools in social media and sensors. This makes critical the factor of tourism business and hospitality as intelligent.

In addition, information also has major importance in the client's decision making in housing, once information technologies have advanced in the publicity space in countries all over the world, making potential foreign clients familiarized with business opportunities in hotels. As one of its consequences, the consumer's decisions have been taken each day more based on information available in the digital environment. Within this context, information technologies and communication are becoming one of the most efficient means of communication and publicity, which allow the target public to be informed about the services of housing at a minimum cost



(Nimatulaev et al., 2020).

Therefore, once ICT have a relevant role in society, in the dynamic of the tourism activity and, from this, have shown to be of extreme importance in areas of tourism work market. This way, for the constant improvement of such services in the market, it is necessary that the ICT have their important reflected on education and taught to students who will be the future workers (Infante-Moro, Infante-Moro & Gallardo-Pérez, 2019). In such statement, it resides the importance in reviewing tourism higher education regarding its essential instrument, considered here the Pedagogic Project.

Higher Education and Pedagogic Projects

The first universities appeared in the context of the Middle Age, when the figure of the “intellectual” became distant from the clergy. However, the Church, not wanting to loose the monopoly of the education, determined that schools would only be allowed to function with an authority who would answer to the Church itself. With the rapid growth of cities in countries such as France, England and Italy, schools also had an important evolution, which led the Church to search for competent lettered who could aid in the management of business and, therefore, contribute to the social ascension of those who attended the schools, emerging, thus, the Medieval Universities (Catramby, 2018).

Brazil, on the other hand, did not have a University during the Colonial and Imperial periods. Despite an initiative from the Jesuit in this sense in 1592, which did not receive the Pope's approval, and the attempt to elevate the Bahia's College to the category of University in 1669, which stumbled in the prohibition of the Portuguese Crown to Brazil, the first isolated institutions of higher education were established and answered to a need to improvise a professional tripod of military officials, doctors and engineers (Tavares, 2000).

Until mid 19th century, Portugal aimed at reproducing in Brazil, in addition to a political institution, a political elite. With the same intellectual preoccupation and mission to the State functions that the original metropolis



in Coimbra received. However, throughout the Empire and the first decades of the Republic, the positivist, which considered the University as a metaphysics institution, which studies the human being in its totality of scientific relations that explain the world rationally, conspired negatively for the creation of an integrated and universal higher education institution. This way, the first Brazilian University was created only in 1912, in the state of Paraná. Posteriorly, the Universities of Rio de Janeiro in 1920, of Minas Gerais in 1927, and of São Paulo in 1934 were founded, being essentially secular and modern (Tavares, 2000).

In the early 2000, in the context of globalization, Schmidt (2000) describes the globalized development anchored in production matrices that demand scientific knowledge and information. Despite the movement being of importation and technology models provoked by the state companies being privatized and the entry of big multinational companies which did not depend on the Brazilian scientific production, only with education it would be possible to for the Brazilian population to be a part of such process (Schmidt, 2000). In this sense, in face of the new technology, productive and social changes, which are gaining space in current days, higher education must be adapted to a formation which offers producing graduates demanded by the current society. Such changes made the periods of utility of professional competencies passed on in traditional programs of universities shorter and leads to uncertainties regarding the future professional who will leave the university (Marquis, 2000). The author still reinforces that to form technicians, professionals and scholars with skills, pedagogic and curriculum reviews that favor a diverse and flexible education are necessary.

Demo (2001), when discussing on the contemporary challenges of education, brings the modernity as the challenge that the future holds for new generations. Implicit within the modernity is the understanding of typical trends of current and future society, in particular its scientific and technological brand, which should be interpreted without fear. Within this context, one of the most important tools in the process of facing



contemporary challenges is the pedagogic process, as instrument which should plan the school year, review and improve the curriculum offer, improve the way that learning is taught showing a positive and crescent evolution capacity (Demo, 2001).

The Brazilian learning institutions have as goal to elaborate a the Pedagogic Project of the Course [PPC] in consonant with the institution's purposes, and each course has its own pedagogic project viewing the particularities of the area (Menezes & Teixeira, 2017). One of the constitutive elements of the PPC, having as basic guidelines the National Curriculum Guidelines, is the curriculum. A group of elements that integrate the processes of teaching and learning in a certain time and context, guaranteeing the course's identity and the respect to diversity (Ministry of Education). In addition, in the pedagogic project there are still elements such as:

knowledge considered necessary to the formation of the established competences from the egresses' profile, structure and curricular content; syllabi, basic and complementary bibliography; teaching strategies; teaching staff; material resources, administration services, laboratory services and infrastructure of support to the full functioning of the course (Ministry of Education, 2006, p. 7)

Therefore, it is of extreme importance to consider the pedagogic project, one it is in its assumptions that a visible and always improvable guarantee of the expected quality in the education process is offered. A pedagogic project may not generate a kind of "official knowledge", which creates fidelity, instead of competence. It is still even more important than the creation of a pedagogic project, the cultivation of it as source of creative and critical inspiration (Demo, 2001).

In tourism higher education course, the first minimum curriculum established by the Ministry of Education [MEC], was published on January 28, 1971 and fixed the content and duration of a Tourism course. As follows, in the same year, the Faculty of Morumbi, current Anhembi Morumbi University became the first institution to offer such course (Caturegli, 1990 quoted by



Matias, 2002).

In the early XXI century, Tourism courses suffered changes in their course load, providing the creating of technological courses and the bachelor's courses offered by private institutions which chose for the reduction of the course load. This way, currently, it is more common to find the full formation course load (bachelor and graduation degrees) in public institutions (Catramby, 2018). Regarding the curriculum, there has been a bureaucratic road up to the implementation of the minimum curriculum. There has been several proposals until the creation of the National Curriculum Guidelines, in which the Tourism graduation courses must enable the professional formation which reveals competences and abilities such as: comprehension of the national and regional policies on tourism; use of appropriate methodology for planning tourism actions; interpersonal and intercultural communication, master of different languages, among others (Ministry of Education, 2003; Catramby, 2016).

The Curriculum Content of the Tourism higher education courses should include in their pedagogic projects and in their curriculum organization, content that meet the following interconnected axes of formation:

I – Basic Content: studies related to Sociological, Anthropological, Historical, Philosophical, Geographic, Cultural and Artistic aspects, which conform the societies and different cultures;

II – Specific Content: studies related to the General Theory of Tourism, Theory of Information and of the Communication, still establishing the relations of Tourism with Administration, Law, Statistics and Accountability, in addition to the mastering of at least one foreign language;

III – Theoretical-Practical Content: studies located in the respective spaces of tourism flow, comprehending technical visits, tourism inventory, learning laboratories and internship (Ministry of Education, 2003; Catramby, 2016).

Regarding the curriculum structure of the course, Catramby (2018)



describes that there is criticism regarding Tourism higher education, for being created in environments where research was not a priority, it was perceived that in higher education, the proper consideration is not given to scientific research and critical consciousness of the students. This way, it has become necessary a review of the content offered by tourism courses and a proper fitting of the pedagogic projects to the current demands of society, such as the Technologies of Information and Communication.

METHODOLOGY

To reach the purposed goal, a research of qualitative and exploratory approach was performed, with the use of descriptive and analytical analysis. The exploratory approach, according to Gil (2002), has as purpose to enable a better comprehension of the aroused issue and to build hypothesis, being the qualitative approach the one that deals with a world of meanings, motives, aspirations, beliefs, values and attitudes and, therefore, may not be quantified (Minayo, 1994). Regarding the descriptive analysis, it has as goal the description of the characteristics of a certain group or phenomenon, starting from analysis of primary and secondary data, and the analytical description aims at developing and clarifying ideas, promoting a general view, of approximate type, regarding the fact (Gil, 2008).

Therefore, in the first step, a bibliographic research was used, with secondary data, once the bibliographic research encompasses the scientific production on a certain subject so that researchers may base their own research in already existing material (Lakatos & Marconi, 2003). Thus, in addition to the research performed in books in order to contextualize the higher education and pedagogic projects, in the research was also developed a search for the keywords: "ITC - Information Technology and Communication" and "Tourism"; in the Web of Science [WoS] data base - through the CAPES Journal's Portal CAPES/MEC -, and in Tourism Publications [PubTur].



The first data base selected to the research, Web of Science, was chosen due to the spread of available academic documents, since it has approximately 12,000 journals and, through the Web of Science it is possible to access tools for the analysis of quotes, references, h index, providing opening to possible bibliometric analysis (Portal Capes, 2021). The access to the data base was possible through the CAPES Portal, considered an important reference in national scope and available through Remote Access through CAFe, provided by the Federal University of Paraná in the service promoted by the National Network of Learning and Research (NLR), which means, by the user name and password provided by the university. Regarding the second data base, Tourism Publications, it is a data base composed by information of the scientific published articles in Iberoamerican Tourism journals, which use the Open Journal Systems [OJS] (Tourism Publications, 2021)

The researches were performed in the month of April of the year 2021, based on titles and on keywords and on the reviews available in the platforms, with a time cuted of the published articles from 2016 to 2021.

Data base	Found	Recovered
Wos – Capes Portal	302	64
Tourism Publications	41	7

Table 1. Structure of Construction of the Bibliographic Review, by Data Base. Source: Own elaboration (2021);

Once the bibliographic research was developed, a second step of the research followed, guided by the document research in electronic media, in primary sources of information. According to Gil (2010), the document research is currently based on cursive records, which are persistent and continuum, having as example documents elaborated by government agencies. This way, such step was divided into two phases: the gather of data from the Higher Education Institutions (HEI) in the document of the National Registration of Courses and Institutions of Higher Education [e-MEC], which enables the identification of all Brazilian HEI, and the identification of all ICT in the websites of Tourism courses in public universities. From this data gathering,



it was possible to classify the 40 Brazilian public universities which offer the course of tourism into four groups, as presented in the table below.

N° of Universities	ICT disciplines
9	Do not present the discipline on the website
7	Do not present the syllabi of the discipline on the website
7	Present the syllabi, but do not have the bibliography
17	Have the discipline with full information on the website

Table 2. Situation of the ICT disciplines in the universities

Source: Own elaboration (2021);

For the 23 universities which had some sort of pendency, e-mails were sent on April 13, 2021, asking for confirmation of the offer of any discipline related to the ICT, for the positive answer, the syllabi was asked for.

At last, 31 disciplines were raised, regarding Information and Communication Technology in 26 universities, being that in five of them, there are two disciplines in the same department.

Abbreviation	Disciplines	Modality
FAIBI	Computing (1)	Mandatory
	Computing Applied to Tourism (2)	Mandatory
FURG	Tourism and Communication	Mandatory
IFG	Information Technology and Communication applied to Tourism	Mandatory
IFMT	Information Technology	Mandatory
UEA	Information Technology	Mandatory
UEG	Information Technology and Communication	Mandatory
UEMG	Innovation and New Technologies	Optional
UEMS	Tourism and Information Technology	Optional
UERN	Computing Instrumentation *	Optional
UFAL	Digital Technologies Applied to Tourism	Mandatory
UFDPAR	Information Technologies and Communication in Tourism	Mandatory
UFF	Technology and Information Systems in Tourism (1)	Mandatory
	Information Technology, Internet and Business (2)	Optional
UFMA	Information Technology and Tourism	Mandatory
UFMG	Methods and Techniques of Analysis of Information for Tourism Planning *	Optional
UFPE	Information Systems Applied to Tourism and Housing *	Mandatory



UFPEL	Systems of Tourism Information - Sti	Optional
UFPR	Information and Communication Technology	Optional
UFRN	Information Systems in Tourism (1)	Mandatory
	Information Technology in Tourism (2)	Mandatory
UFS	Information Systems in Tourism *	Mandatory
UFSCAR	Communication Systems and Information in Tourism	Mandatory
UNEB	Information Technology and Communication (1)	Mandatory
	Information System in Tourism (2)	Mandatory
UNESP	Information Technology and Communication Applied to Tourism	Mandatory
UNESPAR	Information Technology and Communication	Mandatory
UNICENTRO	Information Technology and Communication in Tourism I e II	Mandatory
UNIOESTE	Information Technology and Communication in Tourism *	Mandatory
USP	Challenges in Innovation in Tourism (1)	Mandatory
	Systems of Information in Leisure and Tourism (2)	Mandatory
*Disciplines that do not present bibliography.		

Table 3. Universities with Courses of Tourism that have disciplines based on ICT.
Source: Own elaboration (2021).

After the raising, the 31 syllabi were grouped into a single text document and processed through the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* [IRAMUTEQ], which allows to make statistical analysis on textual embodies and on tables of individuals/words, without losing the context in which the word appears, which makes it possible to integrate quantitative and qualitative levels in the analysis, with higher subjectivity and advances in the interpretation of data from the text (Camargo & Justo, 2013). The version used in this research was the IRAMUTEQ 0.7 alpha 2.

The embody, document that reunites all texts, in this case, the syllabi, was saved in .txt format with the codification Unicode Transformation Format 8 bit code units [UTF-8] so that the reading of the analysis was possible. After indexed the embody in the software the textual analysis were performed: Classification through the Reinert Method and analysis of Similarity (Salviati, 2017). The next section presents the main results and discussions on the application of the employed methodological procedures.



RESULTS AND DISCUSSION

The general embody is formed by 31 texts (syllabi) that after being inserted for the analysis in the IRAMUTEQ, were separated into 80 text segments (TS), with usefulness of 60 TS (75%) for analysis. Then, 2,676 occurrences emerged (words or forms), being 389 hápax (words that appear only once in the embody). The analyzed content was categorized into five classes: Class 1 (23.3%); Class 2 (16.7%); Class 3, (20%); Class 4 (16.7%); and Class 5 (23.3%).

The five text classes are divided into 3 ramifications, which are repercussions according to the similarity found in the embody. Each Class may be nominated from the analysis of the main occurrences, this way Class 1 (red) was defined as como “Operational”; Class 2 (gray) as “Processual”; Class 3 (green) as “Tourism Experience”; Class 4 (blue) as “Communication and Data”; and Class 5 (magenta) as “Tourism Companies”. In Figure 1 it is possible to verify the ramifications and the main words in each class.

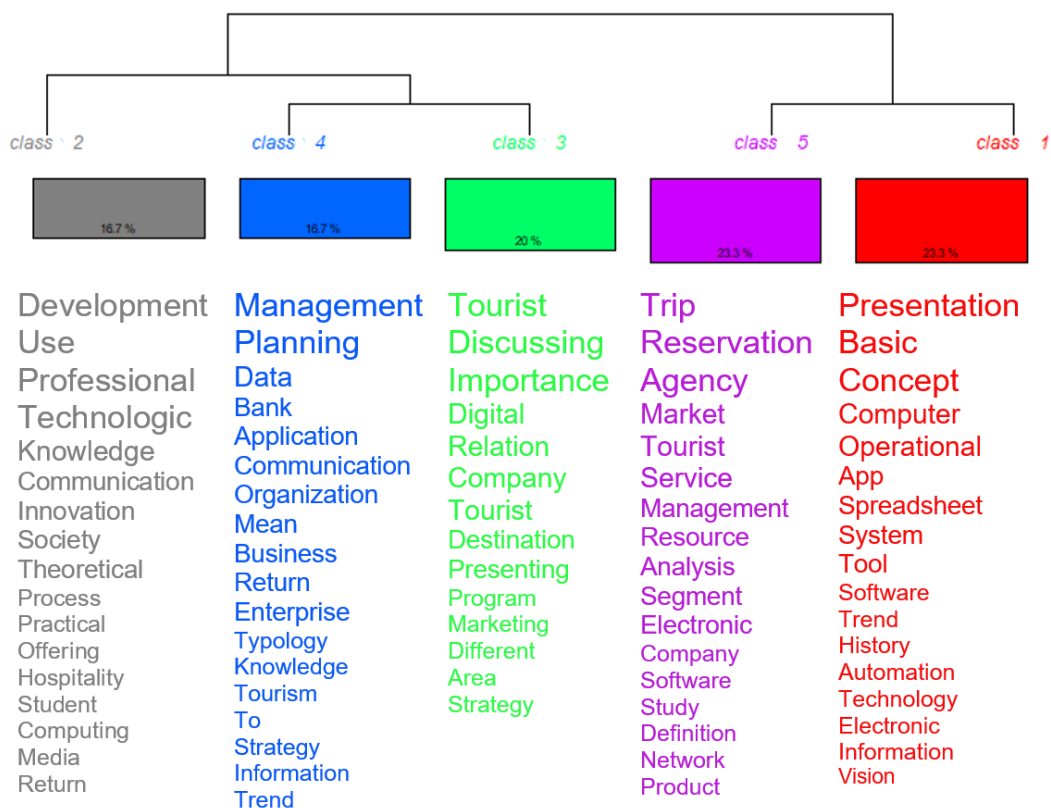


Figure 1. Classes of words from the syllabi.
Source: Own elaboration (2021).



From the classes of words it is possible to identify which syllabi have been more highlighted and which direction the disciplines are directed to. The disciplines FAIBI (1), UEA and UNEB (1) possess more proximity with the Operational Class since it presents the conceptual part, forms of operation of systems and tools used in the tourism activity. The disciplines of FAIBI (2), UEMG, UFDPAR and UNEB (2) are close to Processual Class, once they are characterized by the process of development and innovations in the society's ICT. The Class Tourism Experience is close in the disciplines from IFG, UFSCAR, UNESPAR and USP (1) which is directed in the form that tourists use technologies for consumption in the tourism activity. The Class Communication and Data, present in the disciplines of IFMT, UFF, UFRN(2) and UNIOESTE is related to the form of data analysis and communication to the advance of management. At last, the Class Tourism Companies is highlighted in the disciplines of UEMS, UFPEL, UFRN, UNESP and USP (2), guided by systems used in agencies, hotels, airline companies for reservation and management of the companies.

The Factorial Analysis of Correspondence [FAC], presented in Figure 2, shows how the syllabi have targeting from the incidence of TS in each class, located in the plane and colors defined in the previous analysis.



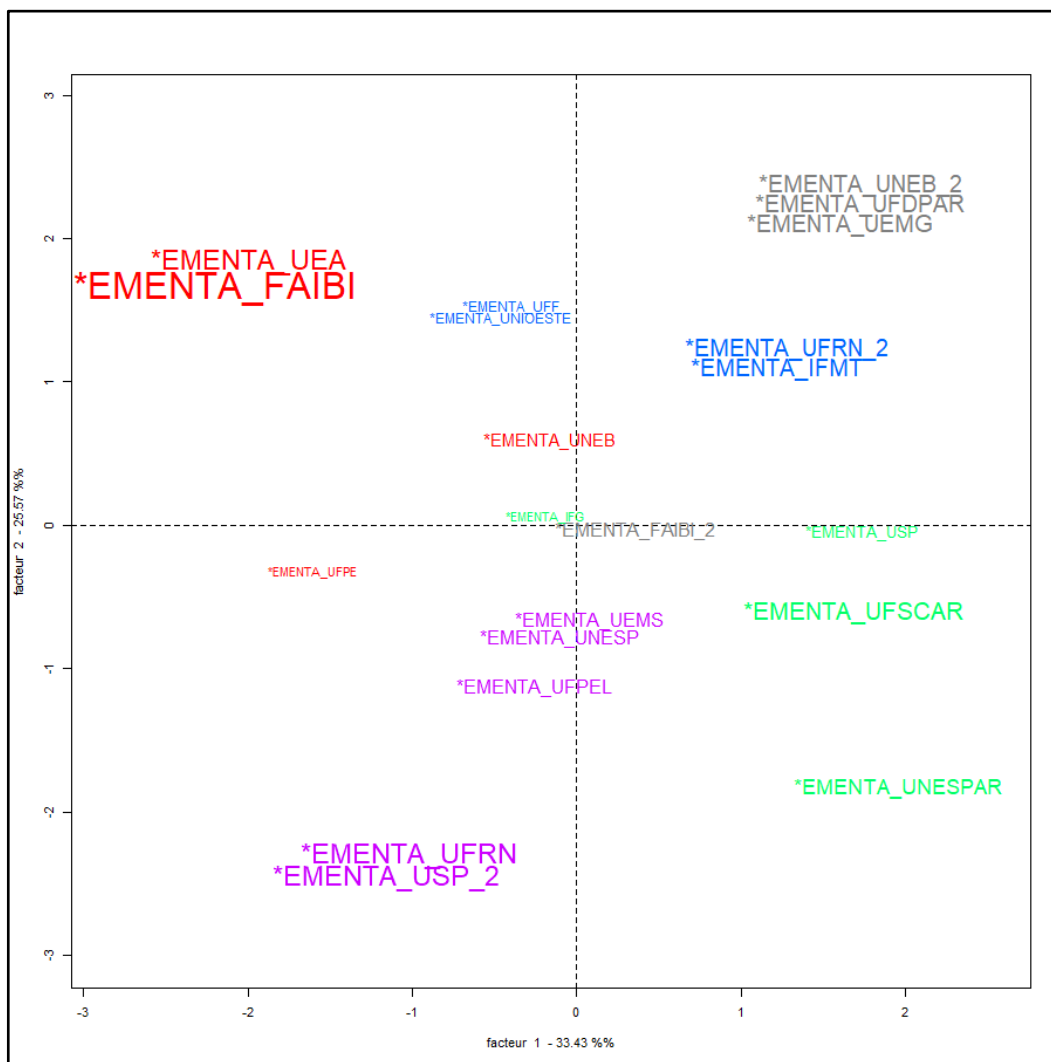


Figure 2. FAC syllabi and classes of words.
Source: Own elaboration (2021).

Both in word Classification, in the ramifications, as well as in FAC, in the position of the plan, it is possible to verify the proximity of certain classes, such as Operational with Tourism Companies. Once that one is turned to conceptualization and usage of tools and the other to the practical application in the market. The classes Tourism Experience and Communication and Data, also present proximity, considering that one is directly related with the tourist and the other more at understanding the data from tourists to use in planning and management.

To have a general analysis of all the syllabi and which the unfolding of the approached subjects in those disciplines are, a similarity analysis was performed, presented in Figure 3, which shows a connection between the



Figure 4 has the same analysis of similarity, thus, there is a visual group among the occurrences, which enables to observe better how the terms are related in the embody.

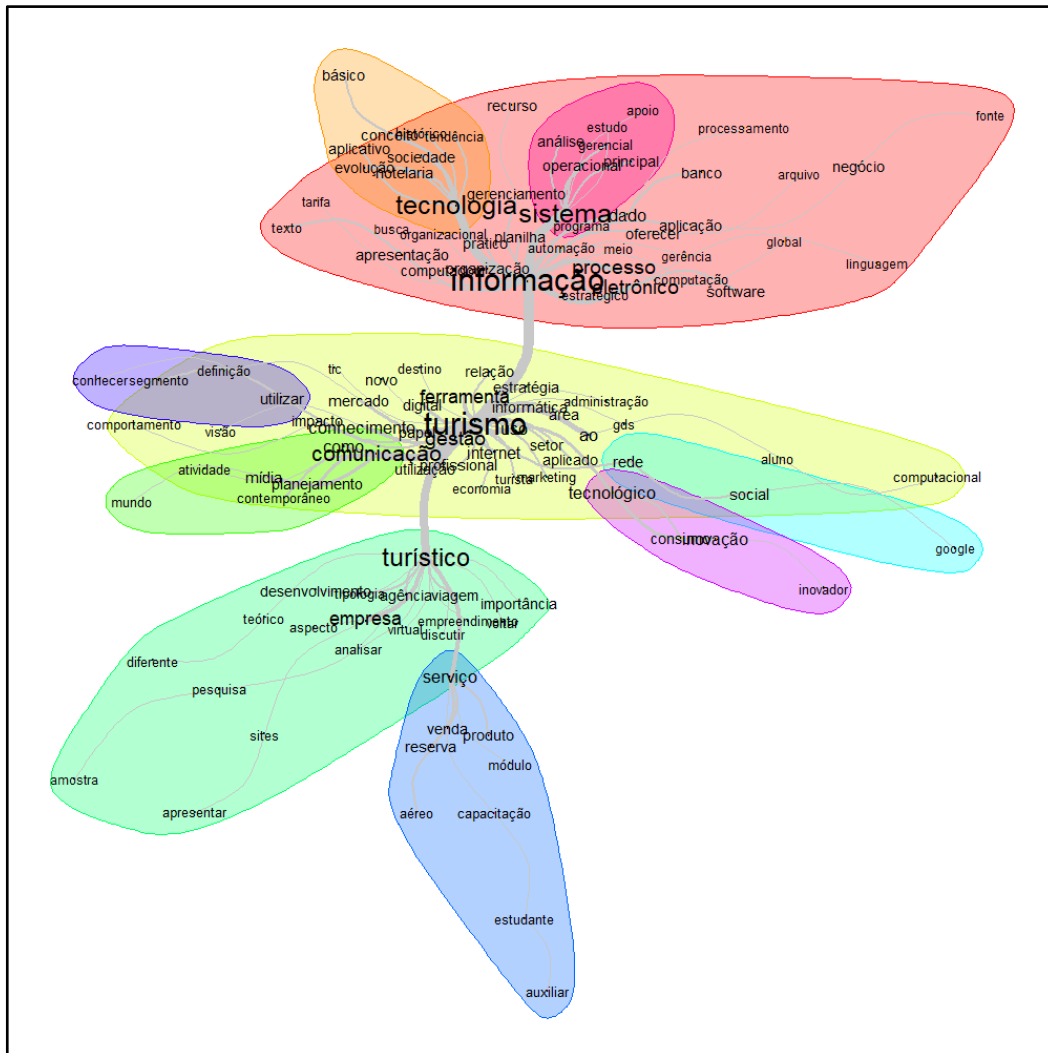


Figure 4. Analysis of the similarity with groups.
Source: Own elaboration (2021)

In Figure 4, it is possible to visualize 10 groups, which show how such words are related in the embody. Tourism is part of a group with several ramifications connected only to it, and also four smaller groups with own ramifications. Observing the words of these groups, it is possible to verify the variety of terms such as “internet”, “destination”, “market” and “economy”, more than once present how diverse the content of the syllabi are. One of the smaller groups is part of the term “communication”, which unlike the

expected, is not related to the ramification of “information”, once the study is about ICT.

In the ramifications from “information”, there is similarity among the terms, such as “processing”, “software” and “automation”, in addition to the subgroups “technology” and “systems”. Still, it is possible to perceive that the syllabi possesses a certain level of agreement regarding such subject taught in the disciplines.

At last, in the group of ramification of the term “from tourism”, there is highlight to the term “company” and to the subgroup “services”, which brings in their loose ends terms as “sell” and “product”. This may be presented as a practical application of ICT in the work market, justifying, therefore, the statement of being in another direction of information.

The analysis from the IRAMUTEQ software present in a visual form which the main subjects approached in the disciplines regarding ICT are and how they may be useful top students from such disciplines to enter the work market. There is much on functionality of the technological tools and of information, observed in the proximity of the classes Operational and Tourism Companies in the analysis of classification and also in the grouped ramifications in “information” and “from tourism” in the analysis of similarity.. Once that there is concentration of tourismologists in the agencies, operators and housing means (Silveira, Medaglia & Nakatani, 2018), locations where the use of reservation systems is essential.

To understand what the theoretical base of the syllabi is, the bibliographic used in the disciplines were raised and identified in the documented research. The author that presents more occurrences is Peter O'Connor, whose book “Distribution of the Electronic Information in Tourism and Housing” is used in eight courses as basic bibliographic. The work combines narrative, analysis and case studies, and the origin of the electronic information in tourism, deals with its current development and evaluates the new technologies and their possible repercussion of the sector on the future. Following, are the authors André Guimarães and Marta Borges with ‘E-tourism:

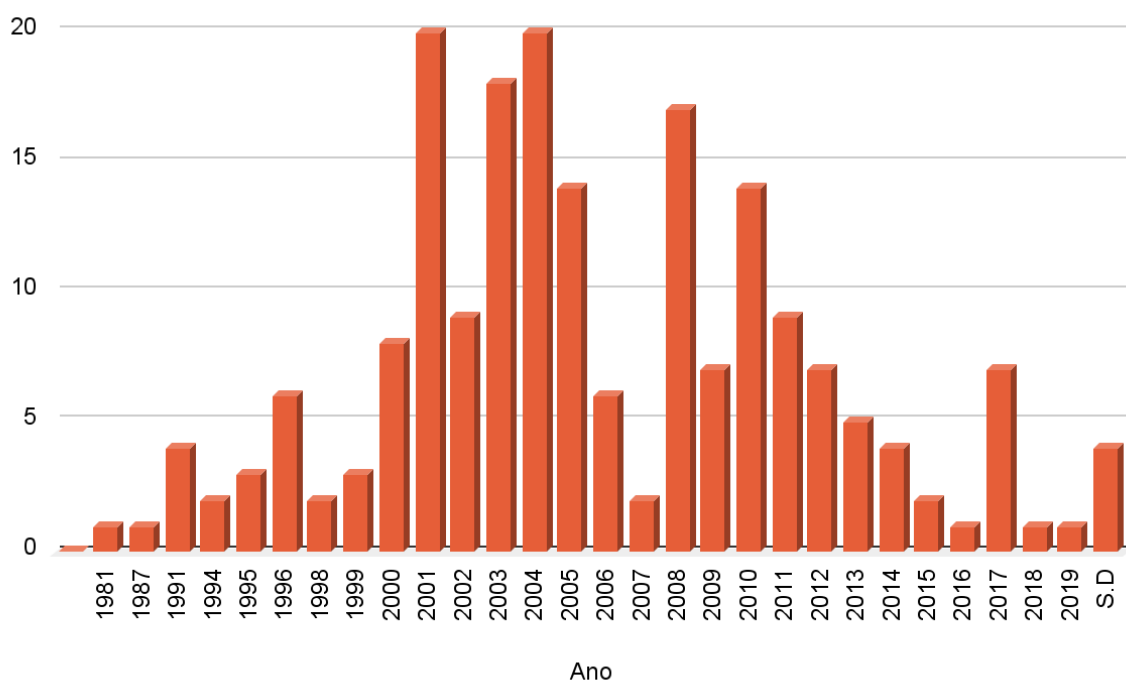


Internet and business of tourism', Philip Kotler in 'Marketing 4.0: From traditional to digital' and Aitor Marín with the work 'Technology of Information in Travel Agencies' as presented in Table 4.

Nº ocurrences	Bibliografy
8	O'CONNOR, P. Distribution of the Electronic Information in Tourism and Housing. Porto Alegre: Bookman, 2001.
6	GUIMARÃES, A. S.; BORGES, M. P. E-tourism: internet and tourism business. São Paulo: Cengage Learning, 2008.
6	KOTLER, P. HERMAWAN, K. IWAN, S. Marketing 4.0: from traditional to digital. Rio de Janeiro: Sextante, 2017.
5	MARIN, A. Technology of Information in Travel Agencies: in search of productivity and aggregated value. São Paulo: Aleph, 2004.

Table 4. Main bibliography in the disciplines focused on ICT. Source Own elaboration (2021).

At total, 159 works used in the 24 disciplines were available in the bibliography of the syllabi. Graph 12 presents a time line of the data of publication of such material.



Graph 1. Years of publication from the bibliography focused on ICT. Source: Own elaboration (2021).



Observing the graphic, it is possible to perceive that there is a high incidence of bibliographies published between the years of 2001 and 2010, which means, publications on information technology and communication with more than a decade. In addition, the first publication present in the analyzed syllabi is from the year of 1981, and as follows, there are still 22 works from the years of 1980 and 1990, presenting a beginning of the studies relative to the theme.

CONCLUSION

The Information and Communication Technologies have an imperative role for the functioning of contemporary society and with tourism activity would not be any different. To investigate the way that knowledge on this area is taught in Higher Education Institutions allows to understand to which way students from tourism courses are being directed when those students were to act in the work market.

The syllabi classification allowed to better understand which commonly approached subjects in general terms in different learning institutions. The disciplines of the Operational class are highlighted since they approach conceptual themes, forms of operation of systems and tools. In the Processual class, the evolution and innovations of ICT in society are presented. With the Communication and Data class, it is possible to develop forms of analysis of data and communication to improve management. The practical application of ICT in the tourism companies day-to-day through systems and tools are most highlighted. The orientation with the experience which the tourist will have in touch with ICT in the process of one's trip and data analysis provided for the improvement of management of a destination or company, also have shown to be important. Once the ICT in tourism have also been introduced to ease the process of management processes of tourism organizations or the trips themselves, to learn about different scopes is related to the needs of such subjects in the day-to-day tourism activity.



This way, the purpose of analyzing disciplines related to ICT in the graduation tourism courses in public universities in Brazil was achieved successfully, through the used research methods.

The IRAMUTEQ software allowed several forms of analysis, which enabled more broadened statements on the object study. According to the Factorial Analysis of Correspondence which presents in form of boxes the distribution of courses in each one of the classes from the incidence of TS. And the Similarity Analysis that shows the relation between the words in the textual embody that are more highlighted and their relations according to the ramifications. With the main terms “tourism” and “information” being distributed into 10 different groups. By being an open access software, which means, for free, it enables the access for development of more qualitative researches that may contribute to the scientific community of all areas.

Among all the analysis, perhaps the one that demanded more concern regarding the formation of tourismologists, was to perceive the period of publication of the bibliographic references employed in the disciplines, being the more used date from the years of 2001 and 2010. Such result of research indicates the need to use additional broad bibliographic reference by part of the professors of those disciplines, in order to deal with possible outdated in a field of constant change, such as information and communication technology.

At last, due to the difficulty in the access of syllabi in the tourism courses' website, as well as the unanswered on the offer of disciplines that are presented are limitations, once the results could have been more complete and broad, in case the syllabi of all disciplines related to the ICT offered in all courses in the country. As a suggestion for future researches, it is possible to also analyze the disciplines offered by private learning institutions. Also, it is possible to relate with the obtained data in this research with the practical application with tourism egresses who attended some discipline related to ICT.



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